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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,781	09/20/2005	Stefan Frenzel	P/2107/278	4925

2352 7590 12/18/2009

OSTROLENK FABER GERB & SOFFEN
1180 AVENUE OF THE AMERICAS
NEW YORK, NY 100368403

EXAMINER	
NGUYEN, COLETTE B	

ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
12/18/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/539,781	FRENZEL ET AL.	
	Examiner	Art Unit	
	COLETTE NGUYEN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-19 and 21-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-19 and 21-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the application

This is the 2nd office action after RCE

Claims1 and 18 are amended.

Claims 1-2, 4-19 and 21-28 are presented for examination,

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claim 1, 2, 6-12, 15, 16, 18, 19, 21, 27, 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Sanders (US6,656,287) in view Schultheiss("Processing of Sugar Beets with Pulsed-Electric fields. IEEE Transactions on Plasma Science, Vol. 30, No.4, Aug 2002).

3. Regarding claim 1 Sanders discloses a process system to produce sugar from plant materials such as sugar cane, sugar beets and chicory but he does not specify using electroporation. The key concept of the Sanders is the necessity to raise the pH up to 12.5pH of the extractant after diffusion process (called preliming step) to enable certain non-sucrose substances contained in juices to decompose and to reach their respective iso-eletric point. In various conventional juice process systems, it may be

desirable to first utilized base to raise the pH of juice prior to a subsequent process step. (Cole 3, ln 50-60, col 4, ln 3-18). Schultheiss on the other hand, teaches a technique using electroporation (it is a well known process used to the inactivation of bacteria in laboratories) on the large scale for the production of nourishment from food plants, such as sugar beets which can be extracted at lower temperature by electric pulse treatment, resulting in appreciable energy savings. He further emphasizes that it is "preferable to treat entire beets" (page 1550 under factory scaling) which means "the biological material remains substantially unaltered in its form and character". Both do not specify low mechanical loading. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Schultheiss of electroporation for sugar beets at low mechanical loading with the teaching of Sanders of alkaline treatment of the extracted liquid from biological materials after diffusion process and apply them to treat the plant materials at a pressure low enough so the biological materials cells are undisturbed to achieve better extraction yields at lower temperatures, and savings in processing costs by minimizing the use of extracted solvents which have to be either evaporated, treated or recycled and less energy. (Schultheiss pg 1547-1549 and Sanders Col.3 ,ln.45-49). The alkalinity treatment of Sanders can be done at anytime, in this case it is used after diffusion (equivalent to step b of the claim) and it is applied to the extracted liquid still has solid particles, flocculants which may be subjected to subsequent process steps (equivalent to step C of the instant claim) (Col4, line28-30). All the critical elements are obvious by both teachings as from the teachings anyone with ordinary skill in the art can apply the

alkalinity treatment to the liquid or to the solids separated from the first step to further extraction of the liquid.

4. Regarding claim 2, Schultheiss teaches a method as claim 1, wherein the biological material in step (a) is subjected to a high voltage field in a conductive medium (Schultheiss : " *High voltage pulses with amplitudes of up to 300kV were created with the help of a six-stage low impedance Marx generator")*

5. Regarding claim 6. Sanders in view of Schultheiss disclose a method as claim 1 wherein, in step (b), the biological material is supplied with at least one auxiliary substance.(Sanders, col,3, ln45-48)

6. Regarding Claim 7, Sanders disclose a method as claim 1, wherein step (c) is carried out at a temperature of from 0-65C. (Sanders, Col.4, ln,38-40," *the clarification and purification or refining is undertaken at a temperature of between about 30 degrees Centigrade to about 40 degrees Centigrade").*

7. Regarding claim 8. Schultheiss discloses a method as claim 1, wherein the biological material comprises at least one of sugar beet and sugar beet chips. (Schultheiss:" *The standard procedure of sugar production from beets consists of carving the fruits into cossettes and subsequently extracting the juice from these cossettes..").*

8. Regarding claim 9, Sanders discloses a method as claim 1 wherein the biological material comprises chicory. (Sanders :" *the diffusion process, the milling process, other processes that remove juice from plant material, or bring plant juice into aqueous solution, result in a juice containing sucrose, non-sucrose substances and water...may include all manner of plant derived substances and non-plant derived substances...).* It would have been obvious for one of

ordinary skill in the art at the time of the invention to include chicory as it is also a plant material wherein the juice is found to be useful for health.

9. Regarding claim 10 and 11. Schultheiss discloses a device for isolating ingredients from biological material according to the method as claim1, said device comprising one appliance for electroporation, one full screw extractor arranged between the appliance for the electroporation and the extractor. (Schultheiss, pg 1548. "Experimental apparatus"). Wherein the full screw is designed as a conveyor screw and wherein a first section of the screw which is designed for receiving the material is formed at a lower point, and a second section of the screw which is designed for receiving the material is formed at an upper point, of a gradient which exist between said first and said second sections,. (Schultheiss. Fig1, 2). The inlet of the screw conveyor is at the low end and the discharge end is at the other end of the screw in an inclined position to save space and to feed the extractor hopper.

10. Regarding claim 12. Sanders teach to use lime to adjust the pH during purification of the juice, i.e. the lime has to be metered to the extract. (Sanders, col 3, ln,52).

11. Regarding claim 15, Sanders discloses a method as claimed in claim 6 wherein the auxiliary substance is at least one of lime and milk of lime (Sanders, Col 5, ln, 41-45).

12. Regarding claim 16, See claim 7 above.

13. Regarding claim 18. Sanders disclose a process system to produce sugar from plant materials such as sugar cane, sugar beets and chicory but he does not specify

using electroporation. The key concept of the Sanders is the necessity to raise the pH up to 12.5pH of the extractant after diffusion process (called preliming step) to enable certain non-sucrose substances contained in juices to decompose and to reach their respective iso-eletric point. In various conventional juice process systems, it may be desirable to first utilized base to raise the pH of juice prior to a subsequent process step. (Cole 3, ln 50-60, col 4, ln 3-18). As the extractant from the first step still has solids materials, flocclulants, the alkalinity treatment that Sanders discloses can be applied to the extracted juices as well as the solids (biological materials) for further extraction. (Col4, line 28-35). Schultheiss on the other hand, teaches a technique using electroporation (it is a well known process used to the inactivation of bacteria in laboratories) on the large scale for the production of nourishment from food plants, such as sugar beets which can be extracted at lower temperature by electric pulse treatment, resulting in appreciable energy savings. He further emphasizes that it is "preferable to treat entire beets" (page 1550 under factory scaling) which means "the biological material remains substantially unaltered in its form and character". Both do not specify low mechanical loading. However, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine the teaching of Schultheiss of electroporation for sugar beets at low mechanical pressure with the teaching of Sanders of alkaline treatment of the first extracted liquid which still has biological materials after diffusion process to achieve better extraction yields at lower temperatures, and savings in processing costs by minimizing the use of extracted

solvents which have to be either evaporated, treated or recycled and less energy. (Schultheiss pg 1547-1549 and Sanders Col.3 ,ln.45-49) .

14. Regarding claim 19. Schultheiss in view of Sanders discloses a method as claim 18 with argument as claim 2 above.

15. Regarding claims 25 and 26. See claim 15 above.

16. Regarding claims 27, 28. see claim 7.

17. **Claims 4, 5, 14, 17 ,21-24** are rejected under 35 USC 103 as unpatentable over Sanders in view of Schultheiss as applied to claim 1, 10 and 18 and further in view of Eugene et al.(EP1257413 or WO0162482 with English machine translation). Both Schultheiss and Sanders do not discuss the details of the feeding screw despite that both do use the screw conveyors for the process of extracting liquids or sugars out of plant materials such as sugar beets. Eugene, on the other hand discloses a method of extraction of liquid from cellular material such as sugar extraction from sugar beet by a combination of a low mechanical pressing (a screw conveyor) at 0.1 MPa and electrical pulse device . (page 2) It would have been obvious for one of ordinary skill in the art at the time of the invention to use the teaching of Eugene of screw conveyor at low mechanical pressure in the method of Schultheiss as modified by Sanders to provide an efficient extracting method with a compact design to save costs in energy and provide better yields of liquid extraction throughput. Eugene discloses that only a moderate pressure, essentially ranging between 1.105 Pa -30Pa and it is unnecessary to use pressures during mechanical pressing. (Page 2) with a screw press. The claimed pressure of 0.5MPa is within the range disclosed therefore encompassed by prior arts.

Response to Arguments

1. After further carefully considerations of the cited prior arts, the possibility for allowance as discussed with the attorney on November 23rd , 2009 is deemed un-appropriate for the following reasons:

a. Sanders' alkalinity treatment is for the liquids with solids still in the extractant after the first diffusion, and the alkalinity treatment is to further extract out more liquids, therefore the claim of alkalinity treatment of the solid materials extracted out of the step b is no different than what Sanders already discloses. Furthermore, it is known in the art, alkalinity treatment of the biological materials or extractants can be applied at any steps.

b. As for the argument of the design of the screw conveyors. As discussed above, Sanders and Schultheiss already disclose a full screw conveyor, and even if the screw conveyor of Eugene is different from the full screw conveyor, as long as the pressure range setting is disclosed- low mechanical loading-then the teachings are obvious as the claim is a method claim and not an apparatus claim.

In conclusion, all the claims are rejected as they are obvious under 35 USC 103(a) as discussed.

Conclusion

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLETTE NGUYEN whose telephone number is (571)270-5831. The examiner can normally be reached on Monday-Thursday, 10:00-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curt Mayes can be reached on (571)-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/COLETTE NGUYEN/
Examiner, Art Unit 1793

December 11, 2009

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793